Resonant Mechanics Field Equation

Using $\mathcal{C}$ as the Cosmological Harmony Constant

Zachery Claude Maarschalkerweerd Jones

Abstract

This report presents the *pure-field* Resonant Mechanics Field Equation (RMFE)—the analog of Einstein's equation specialized to the ideal laminar regime (lane-pure transport, no turbulence, closed ledgers). Chronotactic compression is equated to conserved *phase-work ledgers* (alignment, timing, scalar mass-locking, cohesive topology) plus a uniform renewal background $\mathcal{C}$. This report provides clear definitions and physical meanings for every symbol and term used.

1. Overview

In Resonant Mechanics (RM), visible geometry is the projection of a deeper time-order lattice (*chronotaxy*). Compression of this lattice corresponds to curvature; transport of ordered phase-work proceeds in lane-pure, bi-helical Flow. The field equation equates chronotactic compression to conserved *ledgers* of phase-work, together with a uniform renewal register $\mathcal{C}$.

2. Resonant Mechanics Field Equation

Define the RM analog of the Einstein tensor,

$$K_{ab}[\chi] \equiv R_{ab}(\chi) - \tfrac{1}{2}R(\chi)\, g_{ab} \tag{1}$$

where χ denotes the chronotactic structure that fixes geometric data.

Field Equation (Pure, Laminar):

$$\boxed{K_{ab}[\chi] \;=\; \kappa_{\mathrm{RM}}\left(\Theta_{ab} + \Phi_{ab} + \Xi_{ab} + \Pi_{ab}\right) \;+\; \mathcal{C}\, g_{ab}} \tag{2}$$

Covariant Ledger Closure (Channel Conservation):

$$\nabla^a(\Theta_{ab} + \Phi_{ab} + \Xi_{ab} + \Pi_{ab}) = 0 \tag{3}$$

Scalar (Mass-Locking) Sector:

$$\Xi_{ab} = \nabla_a\sigma\,\nabla_b\sigma - \tfrac{1}{2}g_{ab}\,(\nabla\sigma)^2 - g_{ab}\,V(\sigma), \Box\sigma - V'(\sigma) = J_\sigma \tag{4}$$

Effective Background Curvature (Vacuum Register):

$$\Lambda_{\mathrm{eff}} \;=\; \kappa_{\mathrm{RM}}(-V(\sigma_0)) + \mathcal{C}, \qquad \text{with } \nabla\sigma = 0,\ V'(\sigma_0) = 0 \tag{5}$$

3. Notation and Term Descriptions

3.1 Geometric Objects and Operators

$g_{ab} \equiv g_{ab}$ Spacetime metric (signature implicit); projection of chronotaxy χ into visible geometry.

$R_{ab} \equiv R_{ab}(\chi)$ Ricci tensor built from the Levi–Civita connection of g_{ab}; local chronotactic compression.

$R \equiv R(\chi)$ Ricci scalar; trace of R_{ab} with g_{ab}.

$K_{ab} \equiv K_{ab}[\chi\ ]$ RM analog of the Einstein tensor $[R_{ab} - \frac{1}{2}R\, g_{ab}]$; divergence-free.

∇_a Metric-compatible covariant derivative.

$\Box \equiv \nabla^a \nabla_a$ Covariant d'Alembertian (wave operator).

χ Chronotactic (time-order) structure whose compression projects as curvature.

3.2 Couplings and Constants

$\kappa_{\mathrm{RM}} \equiv \kappa_{\mathrm{RM}}$ RM coupling constant converting ledger densities into curvature (analogue of $8\pi G$).

$\mathcal{C} \equiv \mathcal{C}$ **Cosmological Harmony Constant**: uniform, isotropic background register of a healthy laminar substrate.

Λ_{eff} Effective background curvature including scalar vacuum offset (Eq. 5).

3.3 Ledgers (Stress-Like Channel Tensors)

$\Theta_{ab} \equiv \Theta_{ab}$ **Alignment Ledger** (Electromagnetic Channel): lane-pure transport of *alignment credit*; ordered phase carried by photon modes without lane mixing.

$\Phi_{ab} \equiv \Phi_{ab}$ **Timing Ledger** (Weak Channel): timing discrepancy removed by neutrino carriers; chiral gating allowed, aggregate helicity-neutral.

$\Xi_{ab} \equiv \Xi_{ab}$ **Scalar Mass-Locking Ledger** (Higgs Channel): built from scalar σ and $V(\sigma)$; modulates phase impedance (inertia/mass) locally without directional push.

$\Pi_{ab} \equiv \Pi_{ab}$ **Cohesive Topology Ledger** (Strong Channel): effective stress of strand-tension/confinement and helicity storage; cohesion of compressed bundles; aggregate helicity-neutral.

3.4 Scalar (Mass-Locking) Sector

$\sigma \equiv \sigma$ Mass-locking (higgs channel) scalar; retunes phase impedance (stiffness of a boundary code's lock to the Field).

$V(\sigma)$ Scalar potential; constant offset contributes to background via Eq. 5.

$V'(\sigma)$ Derivative of V with respect to σ.

J_σ Source term for σ (vanishes in pure laminar vacuum).

3.5 Conservation and Structure

$\nabla^a(\Theta_{ab} + \Phi_{ab} + \Xi_{ab} + \Pi_{ab}) = 0$ *Ledger closure*: covariant conservation of total channel content; no phase-credit deficits in laminar Flow.

Lane Orthogonality: Matter/antimatter in opposite-handed helicity lanes, separated by domain membranes (no bulk mixing).

Monotone Time: Chronotaxy remains order-preserving (no phase-index folds); causality maintained.

4. What is $\mathcal{C}$?

In RM, $\mathcal{C}$ is the *uniform harmonic register* of a helicity-neutral, laminar chronotactic substrate:

- **Physical Meaning:** baseline phase-tension with channels quiescent; expresses healthy renewal as an isotropic offset.
- **Geometric Role:** contributes $\mathcal{C}g_{ab}$ in Eq. (2), shifting large-scale corridor spacing.
- **With Scalars:** scalar vacua shift the effective background via $\Lambda_{\text{eff}} = \kappa_{\text{RM}}(-V(\sigma_0)) + \mathcal{C}$ (Eq. 5).

5. Assumptions (Pure Laminar Regime)

- Lane orthogonality and monotone time hold globally.
- No turbulence/defects; channel ledgers close locally and globally.
- Channels are conserved and helicity-neutral in aggregate.

6. Useful Limits

6.1 Laminar Renewal Vacuum

If $\Theta_{ab} = \Phi_{ab} = \Pi_{ab} = 0$ and $\nabla\sigma = 0$ with $V'(\sigma_0) = 0$,

$$\mathrm{K}_{ab}[\chi] \;=\; \Lambda_{\text{eff}}\, g_{ab}, \qquad \Lambda_{\text{eff}} = \kappa_{\text{RM}}(-V(\sigma_0)) + \mathcal{C}$$

6.2 Radiative Corridors (Gravitational Swells)

Linearizing $g_{ab} \to g_{ab} + h_{ab}$ about a laminar background yields, to leading order,

$$\Box_\chi\, h_{ab} = 0$$

i.e. near-nondispersive swell propagation along laminar corridors; small imprints only through structured, conserved Π_{ab}.

7. Relation to General Relativity (Formally)

With $\kappa_{\text{RM}}(\Theta_{ab} + \Phi_{ab} + \Xi_{ab} + \Pi_{ab}) \leftrightarrow 8\pi G\, T_{ab}$ and $\mathcal{C} \leftrightarrow \Lambda$, Eq. (2) matches the GR form. Conceptually, RM replaces "stress-energy of pellets" by conserved *phase-work ledgers*; "mass" is phase impedance retuned by σ.